

Aorto–left atrial fistula, the role of transesophageal echocardiography: a case report

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Endocarditis represents a major complication of prosthetic heart valves, with estimated mortality rates of 50% to 80% even with appropriate therapy¹. Prosthetic endocarditis occurs in approximately 2%– 4% of patients, mainly in the first months after surgery².

Perivalvular leaks with fistulae and abscess formation complicate about one half of valve endocarditis cases, with a prevalence of about 15%, mainly involving the mitral (31%) and aortic (14%) positions³.

The mitral–aortic intervalvular fibrosa, located between the anterior leaflet of the mitral valve and the non-coronary and left coronary cusps of aorta, being relatively avascular, offers little resistance to the spread of infections with abscesses, aneurysm, and fistula formation⁴.

Of the available imaging techniques, transesophageal echocardiography (TEE) represents the method of choice for the non-invasive assessment of para-prosthetic jets⁵. We report a clinical case that illustrates this topic.

A 73 woman with a history of replacement of heart valves (mitro–aortic replacement with biological prosthesis about a year before) was referred for surgical evaluation for a progressive worsening of fatigue and dyspnea and for low-grade fever in the evening. She was diabetic and with rheumatoid arthritis on treatment with corticosteroids. She had a history of previous duodenal ulcer, hysterectomy and splenectomy.

On first medical contact she was in a clinically stable condition, with a blood pressure of 130/82 mm Hg, a regular pulse at 85 bpm and she was afebrile. Cardiac auscultation revealed ejection systolic murmur (4/6 in intensity) on aortic area radiated to all over the precordium. No continuous murmurs were heard. On pulmonary auscultation we found absence of vesicular murmurs at the base of the right lung and bilaterally crackles up to medium fields. Moreover bilateral malleolar edema was observed.

Laboratory tests showed anemia without leukocytosis and biochemistry showed a creatinine value of 2.78 mg/dL. Blood cultures were negative. Electrocardiogram demonstrated sinus

rhythm with first-degree atrioventricular block (P–Q interval: 270 msec), while chest radiography showed right basal pleural effusion.

Transthoracic echocardiography (TTE) showed preserved left and right ventricular volumes and function with a marked left ventricular hypertrophy and left atrial enlargement. The aortic bio-prosthesis had a high transvalvular gradient (maximum of 85 mmHg and medium of 42 mmHg) with a mild para-prosthetic leak in correspondence with the interventricular septum, and similarly the mitral bio-prosthesis showed a high transvalvular gradient (maximum of 25mmHg and medium of 17 mmHg) with a significant para-prosthetic leak at the mitro–aortic junction.

TEE revealed, in addition to the above mentioned TTE findings, the presence of a massive aorto– left atrial fistula in correspondence with the non coronary sinus, which demonstrated first a localized blood collection between the native aortic wall and the prosthesis, and then opening in the left atrium (Fig 1 and 2).

Furthermore the other TTE findings were confirmed by TEE. This clinical case reinforces the superiority TEE over TTE in the assessment of prosthetic valve morphology and function, especially in the presence of complications, such as fibrosis, pannus, endocarditis, abscesses and fistulas⁶.

In fact, the better signal to noise ratio and the proximity of the transducer to the heart make TEE the most accurate clinical examination in the study of prosthetic valves. Moreover anatomical factors favor the morpho-functional evaluation of aorto–left atrial fistulae, because they usually occur from non coronary sinus in correspondence of the posterior aspect of the aorta, an area easily evaluated by TEE.

TEE short (between 30° and 45 °) and long (between 110° and 130 °) axis views on the aortic valve allowed the best visualization of the fistula for the localization, closer to the transducer, of the non coronary sinus.

After the diagnosis, the patient undertook antibiotic treatment with rifampicin, ampicillin– sulbactam and daptomycin

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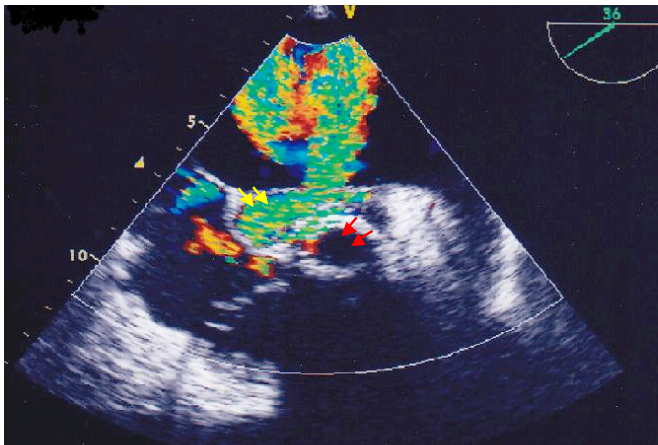


Figure 1. 2-D short axis TEE view demonstrates the left atrium (LA) the prosthetic aortic valve (red arrows), the right atrium (RA) and ventricle (RV). An echolucent area (yellow arrows) with turbulent flow around the aortic valve protruding into LA represents a recess between the biological prosthesis and the native aortic wall, due to the weakening of the aortic wall near the posterior face of the LA. The aortic-atrial fistula is well evident for the turbulent flow coming from the aorta into left atrium.

according to current guidelines⁷ and underwent surgical replacement of the aortic prosthesis with a new biological prosthesis and fistula closure with a patch. The mitral para-prosthetic leak was also repaired.

Post operative TTE evaluation showed good left ventricular function with normal aortic and mitral transvalvular gradients without para-prosthetic leaks.

This case reinforces the pivotal role of TEE in the evaluation of valve prostheses, especially in the presence of complications. Aorto- left atrial fistula represents a rare but possible event, and TTE appears to be completely inadequate for its diagnosis.

Conflict of Interest Statement

None of the authors have any financial or other relations that could lead to a conflict of interest.

Statement of ethical publishing

The authors state that they abode by the statement of ethical publishing of the International Cardiovascular Forum Journal⁸.

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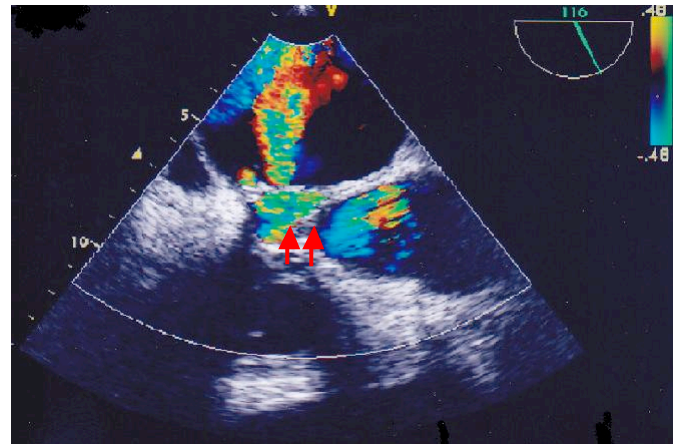


Figure 2. 2-D long axis TEE view showing the left atrium (LA) the prosthetic aortic valve (red arrows) and the ascending aorta (AA). Aorta-atrial fistula is easily recognizable as systolic turbulent flow coming from the aorta into the left atrium in correspondence with the non-coronary sinus.

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